

# SEXUALLY TRANSMITTED DISEASES TESTING IN CALIFORNIA

## 2002 Annual Clinical Laboratory Survey Summary

### Topics Covered in This Issue:

- ◆ *STD Lab Testing*
- ◆ *Case-based Surveillance*
- ◆ *Gonococcal Isolate Surveillance Project (GISP) Antibiotic Susceptibility*
- ◆ *Lab Electronic Readiness*
- ◆ *Recommended Practices*

### Introduction

Since 1996, the California Department of Health Services (CDHS), Division of Communicable Disease Control (DCDC), Sexually Transmitted Diseases (STD) Control Branch has surveyed clinical laboratories throughout California that perform testing for syphilis, gonorrhea, or chlamydia.<sup>1</sup>

The Annual Clinical Laboratory Survey assists disease control efforts by identifying the number and types of laboratories performing STD testing, the number of tests performed, and trends in the use of test technologies.

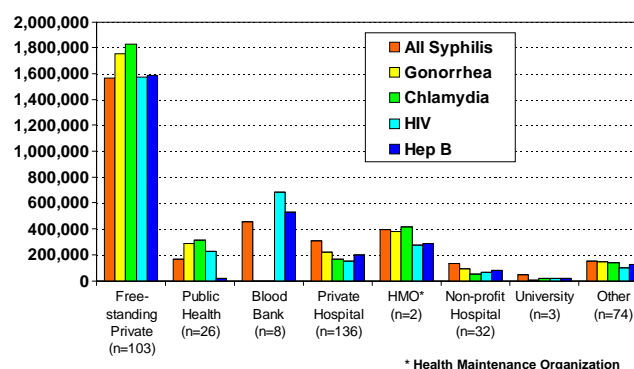
Timely, accurate, and complete laboratory reporting of communicable diseases is essential to health department efforts to effectively identify public health problems and to design cost-effective interventions. California regulations require both health care providers and laboratories to report selected STDs to their local health departments; however, the majority of disease reports are initially received from laboratories.

Laboratories and providers are legally mandated to report findings indicative of syphilis, gonorrhea, chlamydia, and hepatitis B to local health departments for case follow-up activity and epidemiologic analysis.<sup>2</sup> Acquired immune deficiency

syndrome (AIDS) is also a provider reportable condition, and non-name-based human immunodeficiency virus (HIV) reporting by providers became mandatory in California on July 1, 2002.<sup>3</sup>

This report summarizes information from the 2002 Annual Clinical Laboratory Survey. These data are presented along with 2002 disease trend information.

**Figure 1. Number of STD Tests Performed by Type of Laboratory, 2002**



Prepared by the California Department of Health Services

### Overview

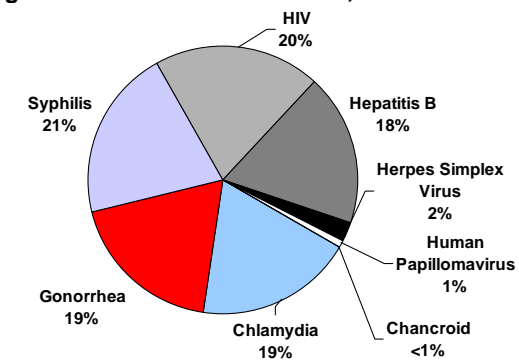
The 2002 Annual Clinical Laboratory Survey was sent to 540 California laboratories that potentially conducted testing for reportable STDs. This summary reports on the 384 labs that responded to our survey and conducted STD tests in 2002 (for further explanation, see Technical Notes, page 6).

In 2002, private sector laboratories (all non-public health laboratories) performed the majority of all reported STD tests (Figure 1). These labs conducted 94.8 percent of syphilis, 90.1 percent of gonorrhea, 89.3 percent of chlamydia, 92.6 percent of HIV, and 99.5 percent of hepatitis B tests. Free-standing private facilities performed the largest proportion

(55.6 percent) of all tests combined. Public health labs performed 6.8 percent of all tests.

Of the 15,399,073 laboratory tests performed to detect STDs, the largest proportions were for syphilis (21 percent) and HIV (20 percent), followed by chlamydia (19 percent), gonorrhea (19 percent), and hepatitis B (18 percent) (Figure 2). The relative distribution of STD tests in 2002 was similar to previous years.

Figure 2. STD Tests Performed, 2002

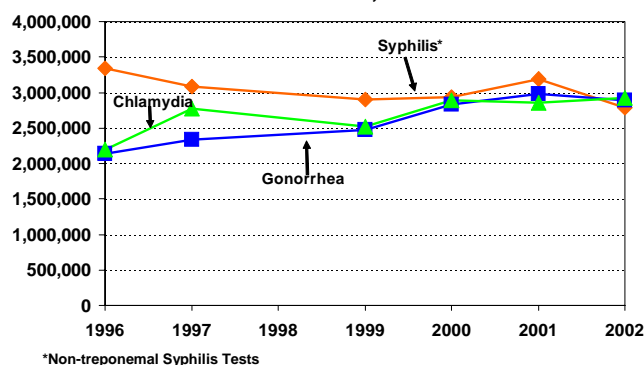


Prepared by the California Department of Health Services

## Bacterial STDs

The total volume of tests in the period 1996–2002 for chlamydia, gonorrhea, and syphilis is displayed in Figure 3.

Figure 3. Chlamydia, Gonorrhea, and Syphilis\*, Total Number of Tests, 1996–2002



\*Non-treponemal Syphilis Tests

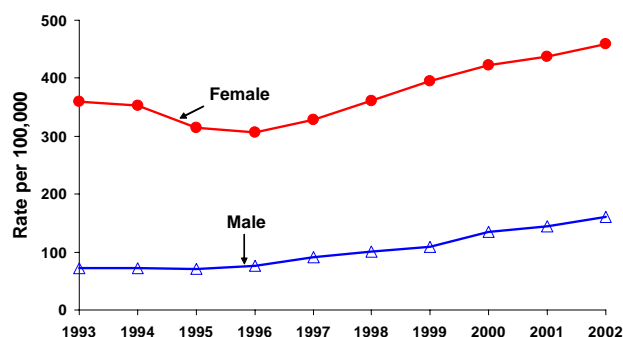
Prepared by the California Department of Health Services

For each of the reportable bacterial STDs, information from California's case-based surveillance system is shown in the following sections to provide a context for interpreting laboratory survey information.

## Chlamydia

- ◆ *Chlamydia trachomatis* remains the most commonly reported infectious disease in California and the United States.
- ◆ In 2002, the rate of chlamydia was 458.9 cases per 100,000 among females, and 161.2 cases per 100,000 among males. Reported rates have increased in both males and females since 1999 (Figure 4).

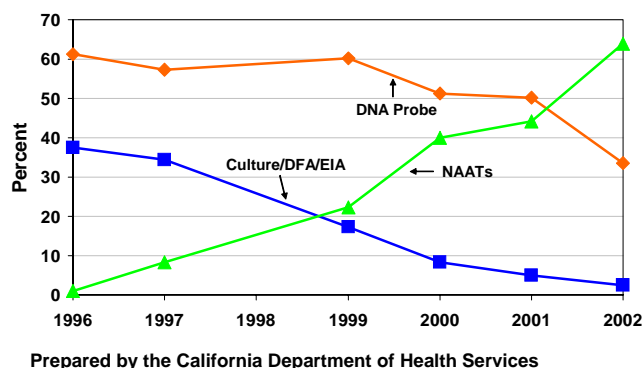
Figure 4. Chlamydia, Rates by Gender, California, 1993–2002



Prepared by the California Department of Health Services

- ◆ Laboratories surveyed reported performing a total of 2,919,899 chlamydia tests in 2002, a decrease of 5.1 percent from 2001 (Appendix 1).
- ◆ Overall, 3.5 percent of all reported lab tests for chlamydia were positive.
- ◆ In 2002, the tests most commonly used for chlamydia were Nucleic Acid Amplification Tests (NAATs) (63.8 percent), followed by DNA probe (33.6 percent). Culture, direct fluorescent antibody (DFA), enzyme immunoassay (EIA), and other tests accounted for the remaining 2.6 percent (Figure 5). The use of NAATs for chlamydia testing has increased from 48.3 percent in 2001.

**Figure 5. Percent of Chlamydia Tests by Test Type, 1996–2002**



- ◆ The National Chlamydia Laboratory Committee recommends performing negative grey zone supplemental testing to enhance the sensitivity of non-amplification test technologies.<sup>4</sup> In 2002, 73.4 percent of labs that reported DNA probe testing performed supplemental testing of grey zone findings.
- ◆ False positive STD test results cause unnecessary health care and emotional costs for patients and their partners. The Centers for Disease Control and Prevention (CDC) strongly recommends using verification assays to increase the specificity of DNA probes and EIA testing.<sup>5</sup> Approximately one-quarter (25.8 percent) of laboratories that performed DNA or EIA testing reported performing verification assays in 2002.

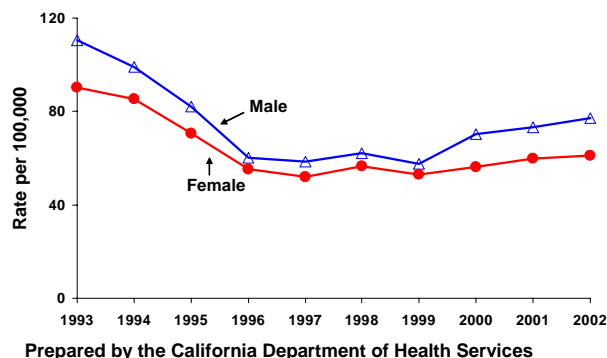
## Gonorrhea

- ◆ *Neisseria gonorrhoeae* is the second most commonly reported infectious disease in California and the United States.
- ◆ Gonorrhea rates increased from 67 cases per 100,000 in 2001 to 69.7 cases per 100,000 in 2002. Rates have increased in both males and females since 1999 (Figure 6).
- ◆ Laboratories surveyed reported performing a total of 2,884,761

gonorrhea tests in 2002, a decrease of 3.1 percent from 2001 (Appendix 2).

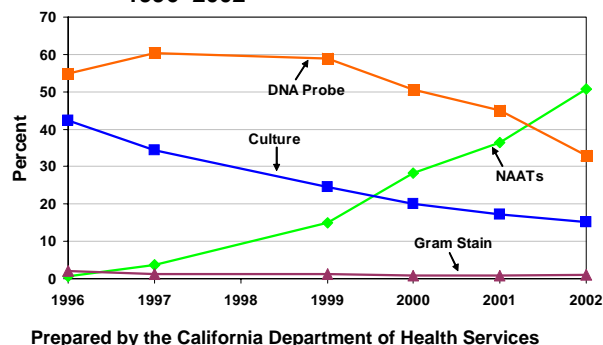
- ◆ Overall, 1.2 percent of all reported lab tests for gonorrhea were positive.

**Figure 6. Gonorrhea, Rates by Gender, California, 1993–2002**



- ◆ NAATs increased from 3.7 percent of gonorrhea tests in 1997 to 50.8 percent in 2002 (Figure 7).
- ◆ In 2002, the most commonly used gonorrhea test type was NAATs (50.8 percent), followed by DNA probe (33.0 percent), and culture (15.2 percent).

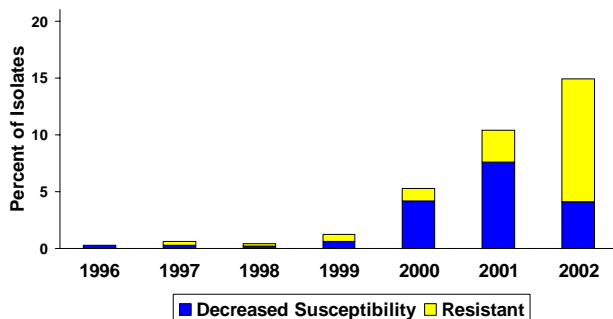
**Figure 7. Percent of Gonorrhea Tests by Test Type, 1996–2002**



- ◆ Use of culture decreased 51.8 percent between 1996 and 2002. Because culture specimens are necessary to test for antibiotic susceptibility, the decreasing number of cultures collected may impact laboratories' ability to monitor antibiotic resistance. Since 1999, California's Gonococcal Isolate Surveillance Project (GISP) has observed substantial increases in antibiotic resistance among isolates

obtained from men visiting four public STD clinics across the state (Figure 8). This increasing prevalence of fluoroquinolone-resistant gonorrhea has prompted new treatment guidelines in California in 2002.<sup>6</sup>

**Figure 8. Percent of *Neisseria Gonorrhoeae* Isolates with Decreased Susceptibility or Resistance to Ciprofloxacin in Four California STD Clinics, 1996–2002**



Prepared by the California Department of Health Services

Note: Resistant isolates have MICs  $\geq 1 \mu\text{g}$  ciprofloxacin/mL. Isolates with decreased susceptibility have MICs of 0.125 to 0.5  $\mu\text{g}$  ciprofloxacin/mL.

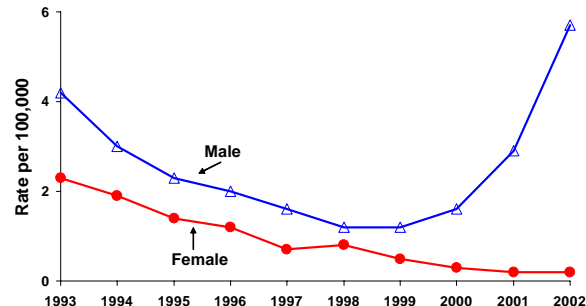
- ◆ Of laboratories that reported culture testing for gonorrhea, 62.8 percent reported beta-lactamase testing of isolates. Based on findings from GISP, which evaluates the antimicrobial resistance of *Neisseria gonorrhoeae*, penicillinase-producing *N. gonorrhoeae* is endemic at such levels that penicillin is no longer included as recommended treatment for gonorrhea.<sup>6</sup> Thus, monitoring beta-lactamase levels is of little clinical value and is unnecessary.

## Syphilis

- ◆ In 2002, the overall rate of primary and secondary syphilis in California was 3 cases per 100,000.
- ◆ In 2002, the rate of syphilis was 0.2 cases per 100,000 among females, and 5.7 cases per 100,000 among males (Figure 9). Higher rates in men have been associated with outbreaks among men who have sex with men (MSM).

These increases of syphilis, which began in 1999 among MSM, have continued through 2002 in California.

**Figure 9. Primary & Secondary Syphilis, Rates by Gender, California, 1993–2002**



Prepared by the California Department of Health Services

- ◆ Labs surveyed in California reported 3,209,951 tests for syphilis in 2002 (Appendix 3).
- ◆ Of all tests for syphilis, 86.9 percent were non-treponemal serology tests and 13.1 percent were treponemal serology or other tests. Few (221) were darkfield or direct fluorescent antibody *Treponema pallidum* (DFA-TP) tests.
- ◆ Of the reported non-treponemal serology tests, 1.4 percent were reactive; of the treponemal serology tests 8.6 percent were positive.
- ◆ Rapid plasma reagin (RPR) accounted for 93.2 percent of all non-treponemal serology tests performed. Venereal Disease Research Laboratory (VDRL) tests accounted for 2.8 percent, and additional other non-treponemal tests accounted for the remaining one percent.
- ◆ *Treponema pallidum* particle agglutination (TP-PA) assay accounted for 62.6 percent of treponemal serology tests, followed by fluorescent treponemal antibody absorption (FTA-Abs) with 14.2 percent. EIA tests and other tests made up the remaining 23.2 percent of treponemal serology tests.

- ◆ Of the 325 labs that performed non-treponemal serology tests, 155 (47.7 percent) reported diluting “rough” tests to rule out prozone reactions. This practice is recommended by the CDC to increase the sensitivity of these tests in early syphilis and reduce false negative test results.<sup>7</sup>

### **Chancroid**

- ◆ Eleven laboratories reported 135 tests for chancroid in 2002, all of which were cultures. None of the tests were reported positive.
- ◆ Only two cases of chancroid were reported in California in 2002. The reporting laboratories did not participate in the 2002 Lab Survey.

### **Viral STDs**

#### **Human Papillomavirus (HPV)**

- ◆ Fifteen laboratories included in the survey offered HPV DNA testing in 2002, performing a total of 132,553 tests. All tests were hybrid capture assays.
- ◆ Of HPV tests performed, 43.4 percent were positive.
- ◆ Because the sampling for this survey emphasized testing for bacterial STDs or HIV (e.g., cytopathology laboratories were not sampled), these totals may be an underestimate of HPV testing activities.

#### **Human Immunodeficiency Virus (HIV)**

- ◆ Of the labs surveyed, 209 performed a total of 3,084,874 HIV tests.
- ◆ The majority (89.6 percent) of the tests performed were EIA screening tests. Confirmatory testing (Western blot and immunofluorescent assay (IFA)) accounted for 1.9 percent of all tests. Qualitative Polymerase Chain Reaction (PCR) testing comprised two percent of all HIV testing. Other screening tests (mostly unspecified blood bank tests) accounted for 6.5 percent of HIV tests.
- ◆ Of the 2,762,980 EIA screening tests performed, less than one percent were positive.
- ◆ Of the 58,367 Western blots performed, 38.2 percent were positive; of the 1,754 IFA tests, 68.4 percent were positive.
- ◆ In addition to HIV detection tests, other HIV related tests were reported by labs surveyed. These included 232,470 viral load tests and 189,058 CD4 count tests. Because the sampling for this survey emphasized testing for detection of HIV infection (e.g., HIV clinical lab facilities were not sampled), these totals may be an underestimate of HIV viral load and CD4 count testing.

#### **Herpes Simplex Virus (HSV)**

- ◆ Of the labs included in the survey, 69 performed 332,013 HSV tests. Of these, 35 percent were culture or direct antigen detection, 50 percent were serologic tests, and 15 percent were other types of tests. Serologic testing decreased by 10.1 percent from 2001 to 2002.
- ◆ Of all non-serologic tests performed, 92.2 percent were culture tests, 26.5 percent of which were positive.

- ◆ Of serology tests performed, 79.6 percent were type-specific HSV-2 tests, 30.7 percent of which were positive. An additional 15.3 percent of HSV tests were HSV-1/HSV-2 combined tests, and 5.1 percent were HSV-1 type-specific tests. Serology tests that do not distinguish between HSV-1 and HSV-2 have limited clinical value.<sup>8</sup>

## **Hepatitis B**

- ◆ Of the surveyed labs, 186 performed a total of 2,834,892 hepatitis B surface antigen tests.
- ◆ 1.5 percent of reported hepatitis B surface antigen tests were positive.

## **Electronic Readiness**

- ◆ In order to prepare for California's migration to web-based electronic laboratory reporting, we began adding survey questions regarding electronic readiness in 2001.
- ◆ Of the 383 laboratories (70.9 percent) that responded to the electronic capabilities questions in 2002, 26 (6.7 percent) reported their electronic ability was fully developed, 33 (8.6 percent) reported it was partially developed, 70 (18.3 percent) reported it was planned but not developed, and 254 (66.4 percent) reported it was neither planned nor developed.
- ◆ Among laboratories with fully or partially developed electronic ability (59 laboratories), web-based data transmission was reported by 31 percent of respondents and current use of Health Level 7 (HL7) messaging standard was reported by 42 percent of respondents.

## **Summary**

Survey data for 2002 documented more than 15 million STD tests in California.

The use of NAATs for chlamydia has increased, accounting for 63.8 percent of all chlamydia tests in 2002. NAAT technologies provide the greatest sensitivity, offer the advantage of using non-invasive specimen collection, and were recommended by the California Chlamydia Action Coalition (CCAC) beginning in 2001.<sup>9</sup>

Gonorrhea culture testing has decreased, accounting for 15.2 percent of all gonorrhea tests in 2002. This decline may adversely affect future antibiotic resistance testing. Current high levels of fluoroquinolone resistance have prompted new gonorrhea treatment guidelines in California. Overall, gonorrhea testing has decreased by 3.1 percent from 2001 to 2002.

## **Technical Notes:**

In June 2003, surveys were mailed to all laboratories that had indicated on the 2001 survey they performed STD testing. Surveys were also mailed to laboratories that had been licensed after 2001.

Los Angeles County Department of Health Services' STD Control Program conducted the laboratory survey for laboratories located in Los Angeles County. All other laboratories in California were surveyed by CDHS, STD Control Branch. Data from both surveys were merged for analysis.

Of the 540 labs that were sent surveys in 2002, 110 did not return the survey and 42 indicated that they were draw stations only, had closed, did not perform STD testing, or refused to complete the survey. Of the remaining 388 labs capable of STD testing, 384 reported actual STD tests performed in 2002. These 384 labs were included in this survey summary.

## Additional Resources

<sup>1</sup>Information on previous laboratory reports and disease trends can be found at the California STD Control Branch website: [www.dhs.ca.gov/ps/dcdc/STD/stdindex.htm](http://www.dhs.ca.gov/ps/dcdc/STD/stdindex.htm)

<sup>2</sup>Information about infectious disease reporting, including a list of reportable diseases and reporting laws, can be found at the California DCDC website. See “Laboratory Reportable Diseases and Conditions”: [www.dhs.ca.gov/ps/dcdc/html/publicat.htm](http://www.dhs.ca.gov/ps/dcdc/html/publicat.htm)

<sup>3</sup>Information about HIV reporting can be found at the California Office of AIDS website. See “HIV Reporting Regulations”: <http://www.dhs.ca.gov/aids/>

<sup>4</sup>National Chlamydia Laboratory Committee, “Negative Grey Zone Supplemental Testing to Enhance Sensitivity of Chlamydia Enzyme Immunoassays and Nucleic Acid Probe Assays”: [www.aphl.org/docs/NCCNGZTesting.pdf](http://www.aphl.org/docs/NCCNGZTesting.pdf)

<sup>5</sup>Recent CDC guidelines for chlamydia and gonorrhea testing: MMWR Oct 18, 2002; 51(RR-15): 1-27. [www.cdc.gov/mmwr/preview/mmwrhtml/rr5115a1.htm](http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5115a1.htm)

<sup>6</sup>Gonorrhea treatment information can be found at the California STD Control Branch website. See “Gonorrhea Treatment Guidelines”: [www.dhs.ca.gov/ps/dcdc/STD/stdindex.htm](http://www.dhs.ca.gov/ps/dcdc/STD/stdindex.htm)

<sup>7</sup>Recent CDC guidelines for syphilis laboratory testing can be found on the CDC website: [www.cdc.gov/std/program/medlab/ApE-PGmedlab.htm](http://www.cdc.gov/std/program/medlab/ApE-PGmedlab.htm)

<sup>8</sup>Guidelines for the use of HSV-2 serologies can be found at the California DCDC website. See “Guidelines for the Use of HSV-2 Serologies”: [www.dhs.ca.gov/ps/dcdc/html/publicat.htm](http://www.dhs.ca.gov/ps/dcdc/html/publicat.htm)

<sup>9</sup>CCAC Recommendations for Screening: [www.ucsf.edu/castd/downloadable/uspstfct.pdf](http://www.ucsf.edu/castd/downloadable/uspstfct.pdf)

# Appendix 1: CHLAMYDIA TESTING IN CALIFORNIA, 1997-2002

STD & Type of Test	Test Characteristics	1997			1999			2000			2001			2002		
		PUBLIC (44)	PRIVATE (637)	TOTAL (681)	PUBLIC (41)	PRIVATE (530)	TOTAL (571)	PUBLIC (38)	PRIVATE (238)	TOTAL (276)	PUBLIC (36)	PRIVATE (202)	TOTAL (238)	PUBLIC (25)	PRIVATE (161)	TOTAL (186)
CHLAMYDIA Culture	# of tests	4,747	309,061	313,808	2,749	52,685	55,434	2,232	41,515	43,747	1,663	37,808	39,471	629	21,293	21,922
	# positive tests	318	2,096	2,414	82	1,105	1,187	69	861	930	53	769	822	9	403	412
	% positive*	6.7%	0.7%	0.8%	3.0%	2.1%	2.1%	3.1%	2.1%	2.1%	3.2%	2.0%	2.1%	1.4%	1.9%	1.9%
CHLAMYDIA DFA	# of tests	5,145	116,481	121,626	3,259	46,844	50,103	3,473	33,088	36,561	3,295	57,548	60,843	414	23,685	24,099
	# positive tests	428	2,509	2,937	233	1,238	1,471	337	722	1,059	316	782	1,098	10	459	469
	% positive*	8.3%	2.2%	2.4%	7.1%	2.6%	2.9%	9.7%	2.2%	2.9%	9.6%	1.4%	1.8%	2.4%	1.9%	1.9%
CHLAMYDIA EIA	# of tests	78,478	437,493	515,971	13,701	314,566	328,267	8,436	152,570	161,006	3,901	39,007	42,908	2,254	26,266	28,520
	# positive tests	3,879	16,794	20,673	1,193	10,529	11,722	555	7,501	8,056	131	2,138	2,269	105	737	842
	% positive*	4.9%	3.8%	4.0%	8.7%	3.3%	3.6%	6.6%	4.9%	5.0%	3.4%	5.5%	5.3%	4.7%	2.8%	3.0%
CHLAMYDIA DNA Probe	# of tests	77,669	1,509,960	1,587,629	51,362	1,473,663	1,525,025	23,344	1,461,647	1,484,991	17,834	1,416,656	1,434,490	2,761	979,741	982,502
	# positive tests	2,671	31,521	34,192	2,003	48,279	50,282	1,148	41,397	42,545	661	44,770	45,431	76	27,636	27,712
	% positive*	3.4%	2.1%	2.2%	3.9%	3.3%	3.3%	4.9%	2.8%	2.9%	3.7%	3.2%	3.2%	2.8%	2.8%	2.8%
CHLAMYDIA LCR	# of tests	82,460	46,878	129,338	212,341	212,964	425,305	167,762	216,283	384,045	201,597	489,147	690,744	124,675	370,252	494,927
	# positive tests	5,285	5,636	10,921	12,020	9,223	21,243	7,976	10,071	18,047	12,627	21,456	34,083	7,584	15,450	23,034
	% positive*	6.4%	12.0%	8.4%	5.7%	4.3%	5.0%	4.8%	4.7%	4.7%	6.3%	4.4%	4.9%	6.1%	4.2%	4.7%
CHLAMYDIA PCR	# of tests	91,493	10,657	102,150	96,179	31,812	127,991	111,977	214,099	326,076	27,383	291,171	318,554	21,517	348,110	369,627
	# positive tests	6,087	121	6,208	6,543	925	7,468	8,001	6,649	14,650	1,875	9,438	11,313	1,513	11,102	12,615
	% positive*	6.7%	1.1%	6.1%	6.8%	2.9%	5.8%	7.1%	3.1%	4.5%	6.8%	3.2%	3.6%	7.0%	3.2%	3.4%
CHLAMYDIA TMA	# of tests	2,202	-	2,202	11,217	-	11,217	9,953	104,565	114,518	6,616	1,946	8,562	36,067	73,766	109,833
	# positive tests	118	-	118	519	-	519	321	5,874	6,195	231	123	354	2,610	4,158	6,768
	% positive*	5.4%	0.0%	5.4%	4.6%	0.0%	4.6%	3.2%	5.6%	5.4%	3.5%	6.3%	4.1%	7.2%	5.6%	6.2%
CHLAMYDIA SDA	# of tests	-	-	-	-	-	-	81,508	252,771	334,279	171,293	295,595	466,888	124,293	764,176	888,469
	# positive tests	-	-	-	-	-	-	2,824	9,356	12,180	8,786	13,570	22,356	6,034	25,768	31,802
	% positive*	-	-	-	-	-	-	3.5%	3.7%	3.6%	5.1%	4.6%	4.8%	4.9%	3.4%	3.6%
CHLAMYDIA OTHER	# of tests	-	-	-	1,132	3,574	4,706	957	6,936	7,893	-	14,192	14,192	-	-	-
	# positive tests	-	-	-	59	260	319	47	262	309	-	372	372	-	-	-
	% positive*	-	-	-	5.2%	7.3%	6.8%	4.9%	3.8%	3.9%	0.0%	2.6%	2.6%	-	-	-
CHLAMYDIA TOTAL	# of tests	342,194	2,430,530	2,772,724	391,940	2,136,108	2,528,048	409,642	2,483,474	2,893,116	433,582	2,643,070	3,076,652	312,610	2,607,289	2,919,899
	# positive tests	18,786	58,677	77,463	22,652	74,873	93,692	21,278	82,693	103,971	24,680	93,418	118,098	17,941	85,713	103,654
	% positive*	5.5%	2.4%	2.8%	5.8%	3.5%	3.7%	5.2%	3.3%	3.6%	5.7%	3.5%	3.8%	5.7%	3.3%	3.5%

\*Percent positive was calculated using only those surveys that provided both the number processed and the number positive.

# Appendix 2: GONORRHEA TESTING IN CALIFORNIA, 1997-2002

STD & Type of Test	Test Characteristics	1997			1999			2000			2001			2002		
		PUBLIC	PRIVATE	TOTAL	PUBLIC	PRIVATE	TOTAL	PUBLIC	PRIVATE	TOTAL	PUBLIC	PRIVATE	TOTAL	PUBLIC	PRIVATE	TOTAL
		(44)	(637)	(681)	(41)	(530)	(571)	(40)	(375)	(415)	(37)	(335)	(372)	(25)	(281)	(306)
GONORRHEA Gram Stains	# of tests	7,656	23,461	31,117	3,380	26,828	30,208	5,397	16,189	21,586	5,043	21,695	26,738	2,251	25,182	27,433
	# positive tests	1,238	586	1,824	692	464	1,156	1,384	309	1,693	1,385	211	1,596	537	236	773
	% positive*	16.2%	2.5%	5.9%	20.5%	1.7%	3.8%	25.6%	1.9%	7.8%	27.5%	1.0%	6.0%	23.9%	0.9%	2.8%
GONORRHEA Culture	# of tests	158,354	645,056	803,410	52,485	554,260	606,745	44,273	520,744	565,017	39,956	473,149	513,105	38,395	398,791	437,186
	# positive tests	4,603	5,721	10,324	1,674	3,874	5,548	1,043	3,971	5,014	1,895	3,199	5,094	4,673	4,565	9,238
	% positive*	2.9%	0.9%	1.3%	3.2%	0.7%	0.9%	2.4%	0.8%	0.9%	4.7%	0.7%	1.0%	12.2%	1.1%	2.1%
GONORRHEA DNA Probe	# of tests	75,523	1,334,210	1,409,733	60,183	1,402,405	1,462,588	37,092	1,385,242	1,422,334	29,569	1,311,812	1,341,381	16,357	937,006	953,363
	# positive tests	812	7,103	7,915	710	11,702	12,412	635	12,704	13,339	673	13,747	14,420	402	7,574	7,976
	% positive*	1.1%	0.5%	0.6%	1.2%	0.8%	0.8%	1.7%	0.9%	0.9%	2.3%	1.0%	1.1%	2.5%	0.8%	0.8%
GONORRHEA PCR	# of tests	-	-	-	-	-	-	8,100	16,704	24,804	18,176	42,010	60,186	21,387	89,156	110,543
	# positive tests	-	-	-	-	-	-	152	232	384	353	393	746	423	2,034	2,457
	% positive*	-	-	-	-	-	-	1.9%	1.4%	1.5%	1.9%	0.9%	1.2%	2.0%	2.3%	2.2%
GONORRHEA LCR	# of tests	52,685	33,966	86,651	196,665	175,050	371,715	171,583	289,076	460,659	126,260	459,845	586,105	69,936	356,863	426,799
	# positive tests	870	228	1,098	4,023	1,480	5,503	3,160	2,796	5,956	3,904	7,289	11,193	1,822	2,850	4,672
	% positive*	1.7%	0.7%	1.3%	2.0%	0.8%	1.5%	1.8%	1.0%	1.3%	3.1%	1.6%	1.9%	2.6%	0.8%	1.1%
GONORRHEA TMA	# of tests	-	-	-	-	-	-	3,070	-	3,070	4,208	757	4,965	27,719	396,350	424,069
	# positive tests	-	-	-	-	-	-	-	-	-	3	33	36	773	2,628	3,401
	% positive*	-	-	-	-	-	-	0.0%	0.00%	0.0%	0.1%	4.4%	0.7%	2.8%	0.7%	0.8%
GONORRHEA SDA	# of tests	-	-	-	-	-	-	76,458	231,348	307,806	145,607	285,609	431,216	109,727	395,446	505,173
	# positive tests	-	-	-	-	-	-	863	1,260	2,123	2,185	11,332	13,517	2,580	3,066	5,646
	% positive*	-	-	-	-	-	-	1.1%	0.5%	0.7%	1.5%	4.0%	3.1%	2.4%	0.8%	1.1%
GONORRHEA OTHER	# of tests	-	-	-	1,732	8,192	9,924	948	10,692	11,640	-	13,909	13,909	-	195	195
	# positive tests	-	-	-	12	85	97	8	122	130	-	83	83	-	18	18
	% positive*	-	-	-	0.7%	1.0%	1.0%	0.8%	1.1%	1.1%	-	0.6%	0.6%	-	9.2%	9.2%
GONORRHEA TOTAL	# of tests	294,218	2,036,693	2,330,911	314,445	2,166,735	2,481,180	346,921	2,469,995	2,816,916	368,819	2,608,786	2,977,605	285,772	2,598,989	2,884,761
	# positive tests	7,523	13,638	21,161	7,111	17,605	24,716	7,245	21,394	28,639	10,398	36,287	46,685	11,210	22,971	34,181
	% positive*	2.6%	0.7%	0.9%	2.3%	0.8%	1.0%	2.1%	0.9%	1.0%	2.8%	1.4%	1.6%	3.9%	0.9%	1.2%

\*Percent positive was calculated using only those surveys that provided both the number processed and the number positive.

### Appendix 3: SYPHILIS TESTING IN CALIFORNIA, 1999-2002

STD & Type of Test	Test Characteristics	Testing Year (# of responding laboratories that conducted syphilis testing)											
		1999			2000			2001			2002		
		PUBLIC ( 42 )	PRIVATE ( 447 )	TOTAL (489)	PUBLIC (39)	PRIVATE (401)	TOTAL (440)	PUBLIC (36)	PRIVATE (351)	TOTAL (387)	PUBLIC (25)	PRIVATE (303)	TOTAL (328)
Non-treponemal Serology													
SYPHILIS	# of tests	198,546	2,700,498	2,899,044	212,041	2,725,268	2,937,309	197,200	2,740,992	2,938,192	157,455	2,632,078	2,789,533
RPR	# positive tests	9,225	45,992	55,217	12,506	43,429	55,935	8,213	38,037	46,250	6,419	32,798	39,217
VDRL (& other NT in 2002)	% positive*	4.6%	1.7%	1.9%	5.9%	1.6%	1.9%	4.2%	1.4%	1.6%	4.1%	1.5%	1.4%
Treponemal Serology													
SYPHILIS	# of tests	3,051	42,667	45,718	1,950	39,494	41,444	1,371	55,116	56,487	540	53,084	53,624
FTA-ABS	# positive tests	1,022	11,542	12,564	735	9,848	10,583	489	20,651	21,140	157	17,773	17,930
	% positive*	33.5%	27.1%	27.5%	37.7%	24.9%	25.5%	35.7%	37.5%	37.4%	29.1%	33.5%	33.4%
SYPHILIS	# of tests	11,240	188,215	199,455	11,560	174,965	186,525	11,040	28,163	39,203	7,910	228,700	236,610
TP-PA	# positive tests	5,061	13,405	18,466	5,456	13,052	18,508	5,520	11,334	16,854	3,792	9,077	12,869
	% positive*	45.0%	7.1%	9.3%	47.2%	7.5%	9.9%	50.0%	40.2% †	43.0%	47.9%	4.0%	5.4%
SYPHILIS	# of tests	-	461	461	-	436	436	-	21,681	21,681	-	39,442	39,442
EIA/IgG	# positive tests	-	66	66	-	69	69	-	1,156	1,156	-	1,184	1,184
	% positive*	0.0%	14.3%	14.3%	-	15.8%	15.8%	0.0%	5.3%	5.3%	0.0%	3.0%	3.0%
SYPHILIS	# of tests	-	-	-	-	-	-	-	-	-	-	48,289	48,289
Other Treponemal	# positive tests	-	-	-	-	-	-	-	-	-	-	646	646
(in 2002 CA & LA)	% positive*	-	-	-	-	-	-	-	-	-	-	1.3%	1.3%
SYPHILIS	# of tests	14,291	231,343	245,634	13,510	214,895	228,405	12,411	104,960	117,371	8,450	369,515	377,965
Total Treponemal	# positive tests	6,083	25,013	31,096	6,191	22,969	29,160	6,009	33,141	39,150	3,949	28,680	32,629
	% positive*	42.6%	10.8%	12.7%	45.8%	10.7%	12.8%	48.4%	31.6%	33.4%	46.7%	7.8%	8.6%
SYPHILIS	# of tests	-	200,877	200,877	-	45,657	45,657	-	139,202	139,202	-	42,232	42,232
Other	# positive tests	-	1,384	1,384	-	207	207	-	680	680	-	309	309
	% positive*	0.0%	0.0%	0.7%	0.0%	0.5%	0.5%	0.0%	0.5%	0.5%	0.0%	0.7%	0.7%
SYPHILIS	# of tests	545	58	603	391	33	424	543	30	573	177	44	221
Darkfield/DFA-TP	# positive tests	29	2	31	12	-	12	69	8	77	6	-	6
	% positive*	5.3%	3.4%	5.1%	3.1%	0.0%	2.8%	12.7%	26.7%	13.4%	3.4%	0.0%	2.7%
Total Syphilis	# of tests	213,382	3,132,776	3,346,158	225,942	2,985,853	3,211,795	210,154	2,985,184	3,195,338	166,082	3,043,869	3,209,951
(excluding titers)	# positive tests	15,337	72,391	87,728	18,709	66,605	85,314	14,291	71,866	86,157	10,374	61,787	72,161
	% positive*	7.2%	2.3%	2.6%	8.3%	2.2%	2.7%	6.8%	2.4%	2.7%	6.2%	2.0%	2.2%

\*Percent positive was calculated using only those surveys that provided both the number processed and the number positive.

† Note: TP-PA total tests and percent positive tests are marked different in 2001 due to a high volume TP-PA laboratory not responding in the 2001 survey.